

What is claimed is:

1. A computer aided surgery navigation system comprising:
  - a. a sensor adapted to sense position of a plurality of indicia
- 5 attached to an item used in surgery;
  - b. computer functionality adapted to receive information from the sensor about position of the indicia and generate information corresponding to position and orientation of a probe to which the indicia are attached;
  - c. a probe adapted to be positioned near a body part, said probe
  - 10 attached to at least one indicium, whereby the position and orientation of the probe is capable of being tracked by said computer functionality;
  - d. imaging functionality attached to at least one indicium, adapted to capture an image of the body part;
  - e. wherein a desired axis for the image is defined by the probe; and
  - 15 f. wherein the imaging functionality is adapted to be moved to the correct position and orientation to capture the desired image by alignment with the axis defined by the probe.
2. A system according to claim 1 wherein at least some of the
- 20 indicia are fiducials.
3. A system according to claim 2 wherein at least some of the fiducials feature reflective surfaces adapted to be sensed by an infrared sensor device.
- 25
4. A system according to claim 1 wherein at least some of the indicia are active devices.
5. A system according to claim 4 wherein at least some of the
- 30 active devices are transponders which emit energy when interrogated.

6. A system according to claim 1 wherein the imaging functionality is manually positioned.

5 7. A system according to claim 1 wherein the imaging functionality is automatically positioned.

8. A system according to claim 7 wherein the imaging functionality is correctly positioned and oriented using information stored in the computer  
10 functionality.

9. A system according to claim 1 wherein the probe has a pointed tip.

15 10. A system according to claim 9 wherein the desired axis comprises a straight line extending from the tip of the probe.

11. A system according to claim 10 wherein the desired axis comprises:

- 20 a) a first point, the position of which is identified to the computer functionality using the probe;
- b) at least one more point, the position of which is identified to the computer functionality using the probe; and
- c) a line extending through the first and at least one more point  
25 generated by the computer functionality.

12. A system according to claim 10, wherein the desired axis is defined by:

- a) placing the tip of the probe at a first point along the desired axis;

b) storing the position and orientation information of the first point in the computer functionality;

c) placing the tip of the probe at a second point along the desired axis;

5 d) storing the position and orientation information of the second point in the computer functionality; and

e) prompting the computer functionality to connect the points.

10 13. A system according to claim 1 wherein a plurality of probes are positioned near the item, defining a plurality of axes for images.

14. A system according to claim 1 wherein the computer functionality retains the information generated corresponding to the location and position of the probe even after the probe is removed.

15

15. A system according to claim 14 wherein the imaging functionality captures the desired image after the probe has been removed.

16. A system according to claim 14 wherein the imaging functionality captures a plurality of desired images after the probes have been removed.

20

17. A system according to claim 1 wherein the imaging functionality is a C-arm fluoroscope.

25 18. A system according to claim 1 wherein the computer functionality is instructed to capture the position and location of a desired axis through the use of a foot pedal.

19. A computer aided surgery navigation system comprising:

a. an infrared sensor adapted to sense position of a plurality of fiducials attached to an item used in surgery;

b. computer functionality adapted to receive information from the sensor about positions of the indicia and generate information corresponding to position and orientation of the item to which the indicia are attached;

c. a probe adapted to be positioned near a body part, said probe attached to at least one indicium, whereby the position and orientation of the probe is capable of being tracked by said computer functionality;

d. imaging functionality attached to at least one indicium adapted to capture an image of the body part;

e. wherein a desired axis for the image is defined by the probe; and

f. wherein the imaging functionality may be moved to the correct position and orientation to capture the desired image by alignment with the axis defined by the probe.

20. A system according to claim 19 wherein the imaging functionality is manually positioned.

21. A system according to claim 19 wherein the imaging functionality is automatically positioned.

22. A system according to claim 19 wherein the imaging functionality is a C-arm fluoroscope.

23. A process for conducting computer aided surgery, comprising:  
I. providing a computer aided surgery system, comprising:  
a. a sensor adapted to sense position of a plurality of indicia attached to an item used in surgery;

b. computer functionality adapted to receive information from the sensor about positions of the indicia and generate information corresponding to position and orientation of the item to which the indicia are attached;

5 c. a probe adapted to be positioned near a body part, said probe attached to at least one indicium, whereby the position and orientation of the probe is capable of being tracked by said computer functionality;

d. imaging functionality attached to at least one indicium adapted to capture an image of the body part;

e. wherein a desired axis for the image is defined by the probe; and

10 f. wherein the imaging functionality may be moved to the correct position and orientation to capture the desired image by alignment with the axis defined by the probe;

II. registering the indicia into the system;

III. positioning the probe relative to a desired axis;

15 IV. storing the position and orientation of the desired axis in the computer functionality;

V. navigating the imaging functionality to the desired axis using the information stored in the computer functionality; and

VI. capturing the desired image.

20